EXHIBIT V

U.S. Patent No. 8,320,566 ("the '0,566 Patent") Exemplary Infringement Chart

The Accused MoCA Instrumentalities are instrumentalities that DISH deploys to provide a whole-premises DVR network over an on-premises coaxial cable network, with DISH "Hopper" and "Joey" nodes operating with data connections compliant with MoCA 1.0, 1.1, and/or 2.0. The Accused MoCA Instrumentalities include the DISH Hopper, DISH Hopper with Sling, DISH Hopper DUO, DISH Joey, DISH Joey 2, and DISH Super Joey, DISH Hopper 3, DISH 4K Joey, and DISH Joey 3, and substantially similar instrumentalities. DISH literally and/or under the doctrine of equivalents infringes the claims of the '0,566 Patent under 35 U.S.C. § 271(a) by using the Accused MoCA Instrumentalities.

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1. A method for communications transmission using orthogonal frequency division multiple access on a network comprising:	The Accused Services are provided using at least the Accused MoCA Instrumentalities including the DISH Hopper, DISH Hopper with Sling, DISH Hopper DUO, DISH Joey, DISH Joey 2, DISH Super Joey, DISH Hopper 3, DISH 4K Joey, and DISH Joey 3, and devices that operate in a similar manner. The Accused MoCA Instrumentalities operate to form a network over an on-premises coaxial cable network as described below. The DISH full-premises DVR network constitutes a network as claimed. The DISH full-premises DVR network is a MoCA network created between at least one Hopper DVR and one or more Joey receivers using the on-premises coaxial cable network. This MoCA network is compliant with MoCA 1.0, 1.1, and/or 2.0. "The MoCA Network transmits high speed multimedia data over the in-home coaxial cable infrastructure. The topology of the in-home coax infrastructure and its associated channel characteristics greatly influence all aspects of the MoCA architecture. In particular, special attention has been given to ensuring network robustness along with inherent low packet error rate performance without the use of retransmissions. This is achieved primarily through the use of full-mesh pre-

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	equalization techniques using a form of Orthogonal Frequency Division Multiplexing (OFDM) modulation referred to herein as Adaptive Constellation 8 Multitone (ACMT)." (MoCA 2.0, Section 5) "For each active ACMT subcarrier, the QAM constellation can vary from 1 to 10 bits per symbol (BPSK through 1024-QAM) where the average number of bits per subcarrier per ACMT symbol is limited to 9.6. Individual subcarriers can also be turned off. As a result, the number of bits per ACMT symbol varies as a function of the channel path." (MoCA 2.0, Section 5.2) "This specification supports the transmission of a very large number of bits in a single symbol. The messages carrying bandwidth requests on the other hand are relatively short. To take advantage of the high density of the physical layer while limiting the overhead required for sending bandwidth requests without increasing the latency, this specification supports the simultaneous transmission of bandwidth requests by multiple MoCA nodes using Orthogonal Frequency Division Multiple Access (OFDMA)." (MoCA 2.0, Section 5.3.1) DISH utilizes the MoCA standard to provide an on-premises DVR network over an on-premises coaxial cable network as described below:

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	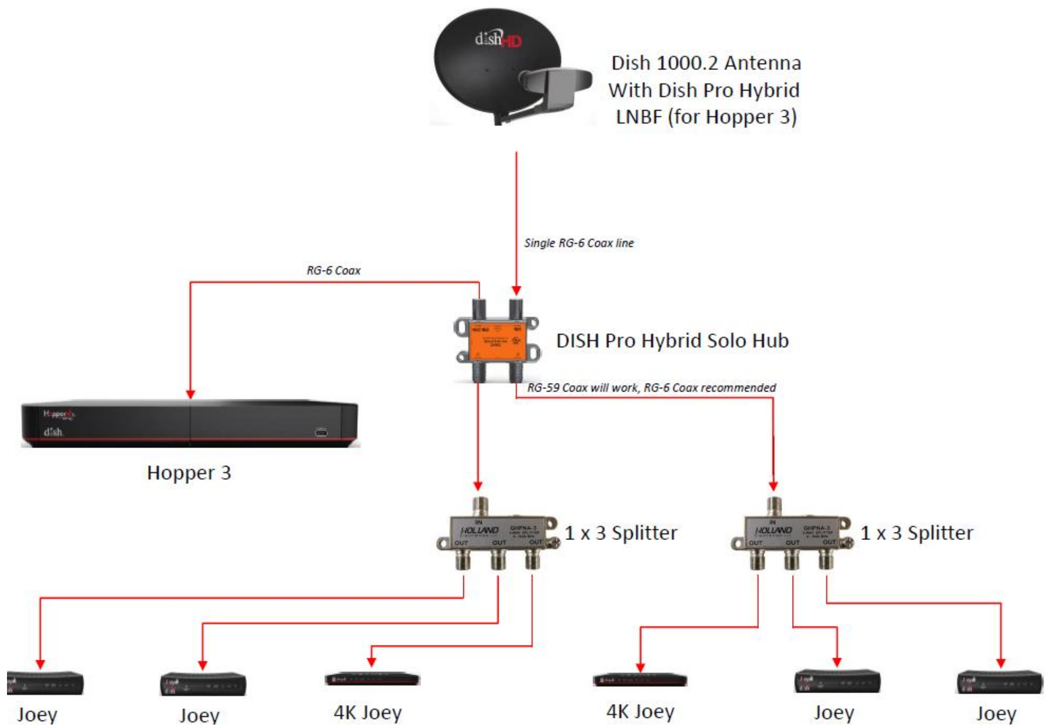 DISH PRO HYBRID SOLO HUB: This Solo Hub is a home video network device that combines multi-orbital coaxial cable satellite feeds from a DISH 1000.2 antenna or switch into a single-cable coaxial satellite feed to support MoCA networking for the Hopper 3 DVRs (host). The client ports are intended to feed up to 6 Joey client receivers (clients). The Solo Hub creates a MoCA video network for Hopper DVRs and Joeys. Rated 50 MHz to 3 GHz. SPLITTERS: 1 GHz common splitters can be used to feed Joey client receivers. HOPPER 3: The Hopper 3 is the revolutionary whole-home DVR from DISH that

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	includes 16 satellite tuners and a 2TB hard drive. JOEY: The Joey is the MoCA thin-client receiver that networks with the Hopper for viewing on additional TVs. 4K JOEY: The 4K Joey is an option for installation on additional 4K TVs. DISH PRO HYBRID 42 SWITCH: This switch allows two Hopper 3 DVRs to be installed using a single DISH traditional 1000.2 antenna. Each Hopper 3 forms its own MoCA video network with connected Joeys. The switch comes with a 110VAC power supply unit. Your new Hopper® 3 receiver is a Whole-Home HD DVR that offers full digital video recording functionality, including pausing live TV, to every TV in your house that is part of your Whole-Home DVR system. The Hopper 3 receiver is the hub for all things entertainment. It is an HD DVR that provides the equivalent of 16 tuners, allowing you to record multiple HD channels at once and at any time and play them back in any room in your home. Using the PrimeTime Anytime® feature, you can record up to six HD channels simultaneously (with your local ABC, CBS, FOX and NBC channels provided in HD, which may not be available in all markets). It is one HD DVR that works independently on as many as four different TVs at the same time, so everyone can be in different room watching their favorite TV programming. Joey® receivers (Joey®, SuperJoey®, Wireless Joey®, 4K Joey™) connect to other TVs in your home and link to the Hopper 3 system, creating a Whole-Home DVR network. It supports all of the features of the Hopper 3 (with the exception of Picture-In-Picture) and offers an identical user interface as the Hopper 3. You can connect a Joey receiver to a high-definition or standard-definition TV.

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	## CONNECTING THE JOEY RECEIVER(S) This section describes how to connect the receiver's **HOME VIDEO NETWORK** connection to one or more cable-ready remote TV(s) located in other room(s) away from the Hopper. You can use these instructions to connect TVs in your home to see live and recorded programming from the Hopper. This installation uses your in-home coaxial cable system. If your home does not have built-in cabling, it will be necessary to run these cables from the Hopper HD DVR to each Joey Receiver conected to a remote TV. Due to the potential complexity of this installation, you should have this professionally installed. Call the DISH Customer Service Center at 1-800-333-DISH (3474) for more information. If you need another remote control, be sure to order the replacement remote control kit for Hopper and Joey that uses UHF-2G signals. Call your DISH retailer, or visit www.mydish.com online, select Upgrades, then Products, and click on Remote & Accessories. 1 Connect the **HOME VIDEO NETWORK** output on the back of the Hopper HD DVR to an existing wall cable outlet using a coaxial cable. 2 Connect the Joey Receiver(s) in other room(s) to existing wall cable outlet(s) using coaxial cable(s). 3 Connect the Joey Receiver(s) to an audio/video input of the remote TV in each room. • If it is a high-definition TV or monitor and an HDMI connection is available on the remote TV, use a single HDMI cable from the output on the back of the Joey Receiver to provide high-quality audio and HD/SD video. See page 94. • If it is a standard-definition TV or an HDMI connection is not available on the remote TV, use composite (yellow) video and stereo audio cables from the outputs on the back of the Joey Receiver. See page 95. 4 Turn on every Joey Receiver and remote TV connected to the in-home cabling system. If you have not already done so, you may need to pair a remote control to each Joey. 5 Follow the on-screen prompts or included instructions for linking each Joey Receiver to your Hopper HD DVR. (The Hopper is the host for DISH Whole-Home DVR services.) 6 Confirm that you see a picture from your Joey Receiver(s) on your remote TV(s). • If your picture looks good, then you are finished with this procedure. • If your TVs do not display a picture or if the picture is not as clear as you would like it to be, repeat the steps to confirm all the connections. Coaxial connections should be hand-tightened.

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a) providing a plurality of transmitting network devices with a set of available subcarriers for orthogonal frequency division multiple access;	The Accused MoCA Instrumentalities operate to provide a plurality of transmitting network devices with a set of available subcarriers for orthogonal frequency division multiple access as described below. For example, by virtue of their compliance with MoCA, the Accused MoCA Instrumentalities include circuitry and/or associated software modules that provide a plurality of transmitting network devices with a set of available subcarriers for orthogonal frequency division multiple access. “Typical in-home coaxial networks are configured as a branching tree topology with the point of demarcation being at the Point of Entry (PoE), typically on the side or the roof of the house, and outlets distributed throughout the house. The PoE is typically connected to the first splitter in the home at the point called root node through a coax cable. The root node is the common port of the first splitter from which all the MoCA nodes can be reached by transversing only through the forward paths of splitters. In order to get video and/or broadband data services, the root node is connected to a multi-tap in the cable MSO’s coax distribution plant, to an Optical Network Terminal (ONT) in Fiber-To-The-Curb (FTTC) network., or to an ODU for a home with a satellite service. Figure 1-1 shows an example of a typical in-home coaxial network. The MoCA devices inside the home communicate with each other by having their signals traverse across one or more splitters. When the signal traverses between two outputs of a single splitter, this is referred to as “splitter jumping”. Splitter jumping is always necessary when the signal must traverse between outlets in the home.” (MoCA 2.0, Section 1.2.2)

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<tr><th>U.S. Patent No. 8,320,566</th><th>The Accused MoCA Instrumentalities Form a Network That Practices at Least Claim 1 of the ’0,566 Patent</th></tr>
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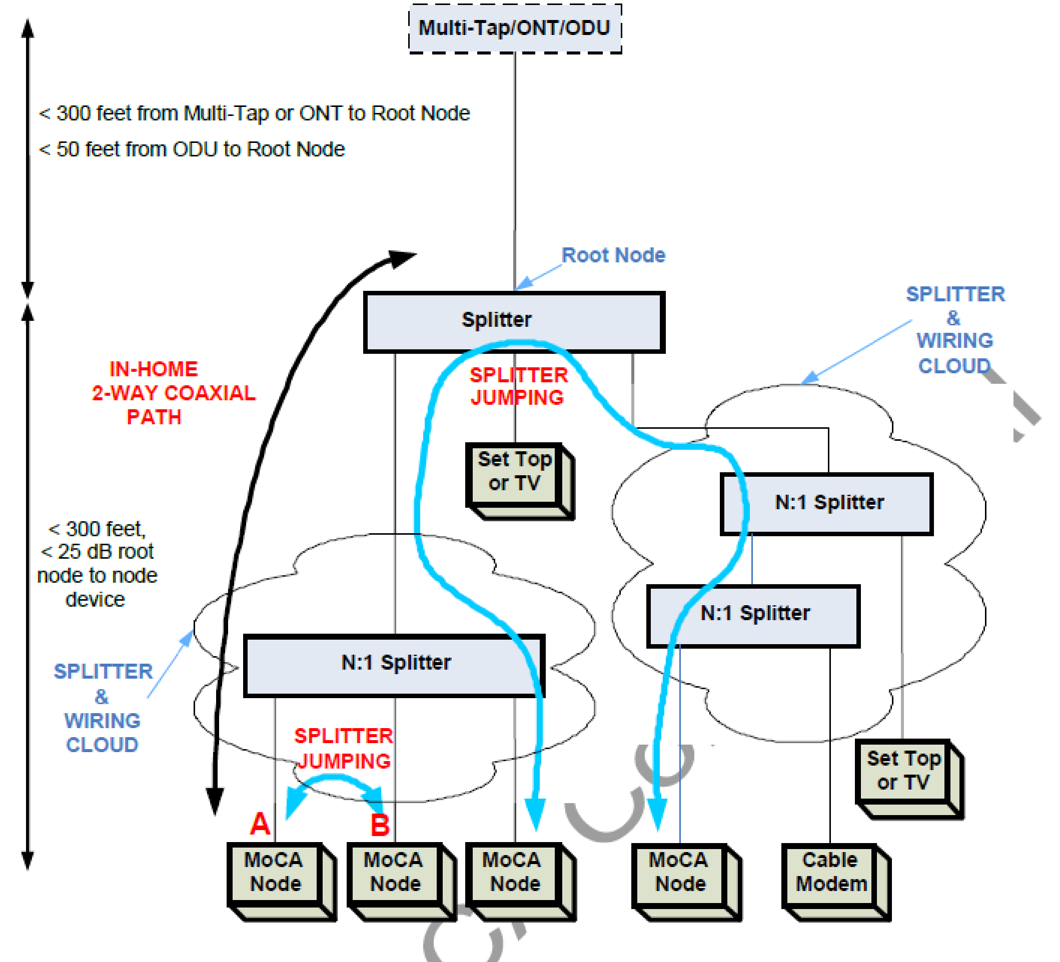

Figure 1-1. A Typical In-Home Coaxial Network

(MoCA 2.0, Figure 1-1)

“This specification supports the transmission of a very large number of bits in a
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	single symbol. The messages carrying bandwidth requests on the other hand are relatively short. To take advantage of the high density of the physical layer while limiting the overhead required for sending bandwidth requests without increasing the latency, this specification supports the simultaneous transmission of bandwidth requests by multiple MoCA nodes using Orthogonal Frequency Division Multiple Access (OFDMA).” (MoCA 2.0, Section 5.3.1) “The MoCA PHY utilizes a modulation technique named ACMT. ACMT is a variation of OFDM where channel parameters are measured and used to pre-equalize all signals using variable bitloading on all subcarriers.” (MocA 2.0, Section 5.2) “The NC MUST define between 2~32 Sub-Channels, inclusive, and distribute Sub-Channel Definition Table(s) (Table 6-35). These Sub-Channels need not be equal or contiguous bands, and guard bands are not needed.” (MoCA 2.0, Section 14.9.2) “The NC MUST assign Sub-Channels for use by each requesting node participating in a particular OFDMA PHY-frame, and distribute Sub-Channel Assignment Table(s) (Table 6-36). Each OFDMA requesting node MUST be capable of storing and using up to three of these tables, as designated by the NC, and MUST store up to three additional backup tables as defined and distributed by the Backup NC.” (MoCA 2.0, Section 14.9.3) “The NC MUST assign to each participating requesting node an integer number […] of Sub-Channels.”

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	(MoCA 2.0, Section 14.9.3)
b) providing a corresponding element of a pseudorandom noise sequence for each subcarrier of the set of available subcarriers;	The Accused MoCA Instrumentalities operate to provide a corresponding element of a pseudorandom noise sequence for each subcarrier of the set of available subcarriers as described below. For example, by virtue of their compliance with MoCA, the Accused MoCA Instrumentalities include circuitry and/or associated software modules that provide a corresponding element of a pseudorandom noise sequence for each subcarrier of the set of available subcarriers. "This section describes the indexing for 512 subcarriers, the 32 unavailable subcarriers, and the bit-mapping of serialized PHY payload bits for subcarriers utilizing the new 512-QAM and 1024-QAM constellations. The bit-mappings for subcarriers utilizing lower density constellations (i.e., BPSK through 256-QAM) SHALL remain as described in [7]. Although the bit-mapping process is defined in this section, it SHALL also apply to EVM and Receiver-Determined Probe payloads." (MoCA 2.0, Section 14.3.6) "Constellation Bin-Scrambling SHALL be applied to Data/Control PHY-frame payloads as follows: The phase 3 of every used subcarrier (i.e. every subcarrier modulated with one or more PHY payload bits) MUST be 4 scrambled using the 15th-order pseudorandom noise (PN-15) sequence defined by the generator polynomial: $X^{15} + X + 1$." (MoCA 2.0, Section 14.3.7)

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	"The Modulation Profile specifies an integer number of PHY payload bits between 0 (no bits) to 10 bits that SHALL be bit-mapped to each of the 480 available subcarriers in every OFDM symbol in a given PHY payload." (MoCA 2.0, Section 14.3.6.2) "Constellation Bin-Scrambling SHALL be applied to OFDMA PHY-frame payloads as follows: The PN-15 sequence generator SHALL be advanced after each of the 480 available subcarriers in each payload symbol, regardless of which subcarriers are used by the OFDMA transmitter. The seed value of the shift register SHALL be initialized to 0x3EA9 before the beginning of each OFDMA payload. The first bit out of the PN generator SHALL scramble the first available payload subcarrier, prior to the first clocking of the shift register. The sequential scrambling of available subcarriers SHALL occur in ascending order of the subcarrier index." (MoCA 2.0, Section 14.3.7)
c) allocating a subset of the set of available subcarriers to each of the transmitting network devices;	The Accused MoCA Instrumentalities operate to allocate a subset of the set of available subcarriers to each of the transmitting network devices as described below. For example, by virtue of their compliance with MoCA, the Accused MoCA Instrumentalities include circuitry and/or associated software modules that allocate a subset of the set of available subcarriers to each of the transmitting network devices. "OFDMA transmissions are scheduled coincidently, such that PHY-frames from two or more nodes co-occupy the medium simultaneously." (MoCA 2.0, Section 14.1) "Orthogonal Frequency-Division Multiple Access (OFDMA) enables multiple nodes to simultaneously transmit PHY-frames, each utilizing only a subset of subcarriers.

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	The OFDMA subcarrier subset is pre-allocated to nodes by the NC on a mutually-exclusive basis." (MoCA 2.0, Section 14.9) "In order to use OFDMA, a MoCA 2.0 NC MUST perform OFDMA LMOs and generate and distribute an OFDMA Sub-Channel Definition Table and OFDMA Sub-Channel Assignment Tables. The NC MUST distribute the OFDMA Sub-Channel Definition Table and OFDMA Sub-Channel Assignment Tables using the Report Elements defined by Table 6-35 and Table 6-36 respectively." (MoCA 2.0, Section 7.2.1) "The number of requesting nodes (N_{Tx}) assigned by the NC to co-occupy a particular OFDMA PHY-frame SHALL be between 2 to 8, inclusive." (MoCA 2.0, Section 14.9.1)
d) a transmitting network device of the plurality of devices mapping a packet onto a plurality of used subcarriers of its allocated subset of available subcarriers, wherein the step of mapping the packet comprises mapping the packet onto a plurality of quadrature amplitude modulated symbols to be transmitted on the used subcarriers;	The Accused MoCA Instrumentalities include a transmitting network device of the plurality of devices mapping a packet onto a plurality of used subcarriers of its allocated subset of available subcarriers, wherein the step of mapping the packet comprises mapping the packet onto a plurality of quadrature amplitude modulated symbols to be transmitted on the used subcarriers as described below. For example, by virtue of their compliance with MoCA, the Accused MoCA Instrumentalities include circuitry and/or associated software modules that map a packet onto a plurality of used subcarriers of its allocated subset of available subcarriers, wherein the step of mapping the packet comprises mapping the packet onto a plurality of quadrature amplitude modulated symbols to be transmitted on the used subcarriers.

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	"OFDMA transmitters MUST organize the union of their assigned Sub-Channels into a Modulation Profile and MUST perform Subcarrier Modulation Bit-Mapping in ascending order of subcarrier index number as specified in Section 14.3.6." (MoCA 2.0, Section 14.9.3) "For each active ACMT subcarrier, the QAM constellation can vary from 1 to 10 bits per symbol (BPSK through 1024-QAM) where the average number of bits per subcarrier per ACMT symbol is limited to 9.6. Individual subcarriers can also be turned off. As a result, the number of bits per ACMT symbol varies as a function of the channel path." (MoCA 2.0, Section 5.2) "This section describes the indexing for 512 subcarriers, the 32 unavailable subcarriers, and the bit-mapping of serialized PHY payload bits for subcarriers utilizing the new 512-QAM and 1024-QAM constellations. The bit-mappings for subcarriers utilizing lower density constellations (i.e., BPSK through 256-QAM) SHALL remain as described in [7]. Although the bit-mapping process is defined in this section, it SHALL also apply to EVM and Receiver-Determined Probe payloads." (MoCA 2.0, Section 14.3.6) "The Modulation Profile specifies an integer number of PHY payload bits between 0 (no bits) to 10 bits that SHALL be bit-mapped to each of the 480 available subcarriers in every OFDM symbol in a given PHY payload." (MoCA 2.0, Section 14.3.6.2)

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	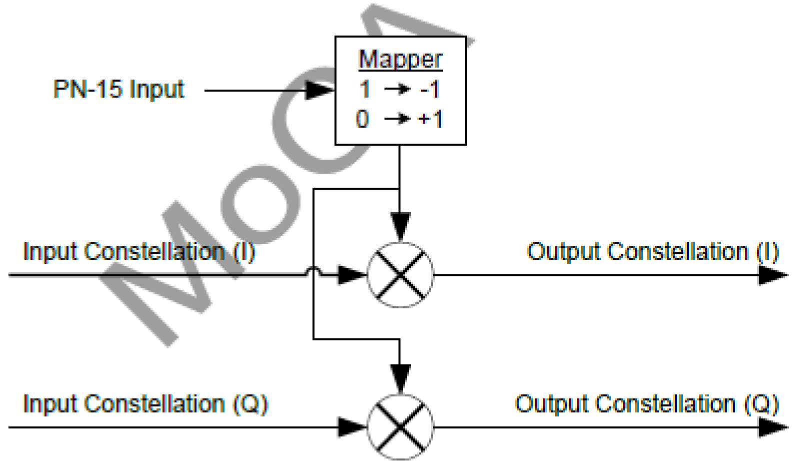 **Figure 14-11. Constellation Bin-Scrambler** (MoCA 2.0, Figure 14-11)
e) the transmitting network device performing a predetermined transformation on a quadrature amplitude modulated symbol using the element of the pseudorandom noise sequence corresponding to the used subcarrier;	The Accused MoCA Instrumentalities include the transmitting network device performing a predetermined transformation on a quadrature amplitude modulated symbol using the element of the pseudorandom noise sequence corresponding to the used subcarrier as described below. For example, by virtue of their compliance with MoCA, the Accused MoCA Instrumentalities include circuitry and/or associated software modules that perform a predetermined transformation on a quadrature amplitude modulated symbol using the element of the pseudorandom noise sequence corresponding to the used subcarrier. "Constellation Bin-Scrambling of OFDMA payloads SHALL be performed as described in Section 14.3.7." (MoCA 2.0, Section 14.9.6)

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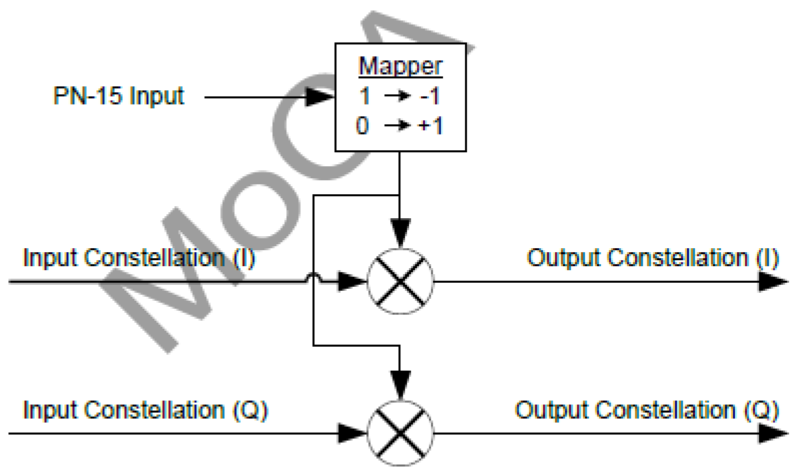
	"Constellation Bin-Scrambling SHALL be applied to OFDMA PHY-frame payloads as follows: The PN-15 sequence generator SHALL be advanced after each of the 480 available subcarriers in each payload symbol, regardless of which subcarriers are used by the OFDMA transmitter. The seed value of the shift register SHALL be initialized to 0x3EA9 before the beginning of each OFDMA payload. The first bit out of the PN generator SHALL scramble the first available payload subcarrier, prior to the first clocking of the shift register. The sequential scrambling of available subcarriers SHALL occur in ascending order of the subcarrier index." (MoCA 2.0, Section 14.3.7)  **Figure 14-11. Constellation Bin-Scrambler** (MoCA 2.0, Figure 14-11)

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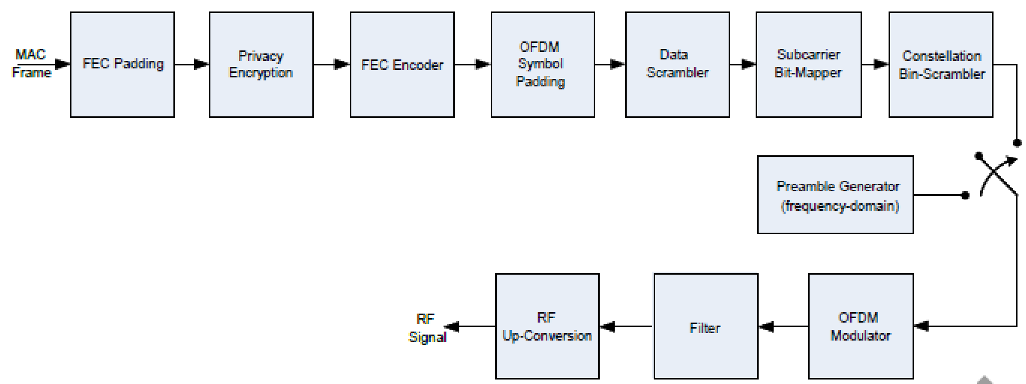
f) the transmitting network device transmitting the transformed symbol to a receiving network device.	The Accused MoCA Instrumentalities include the transmitting network device transmitting the transformed symbol to a receiving network device as described below. For example, by virtue of their compliance with MoCA, the Accused MoCA Instrumentalities include circuitry and/or associated software modules that transmit the transformed symbol to a receiving network device. "The MoCA 2.0 transmitter processing reference model for generating Data/Control PHY-frames from 39 MAC-frames is shown in Figure 14-2." (MoCA 2.0, Section 14.2.1.1)  **Figure 14-2. Transmitter Processing Reference Model for Data/Control PHY-Frames** (MoCA 2.0, Figure 14-2)

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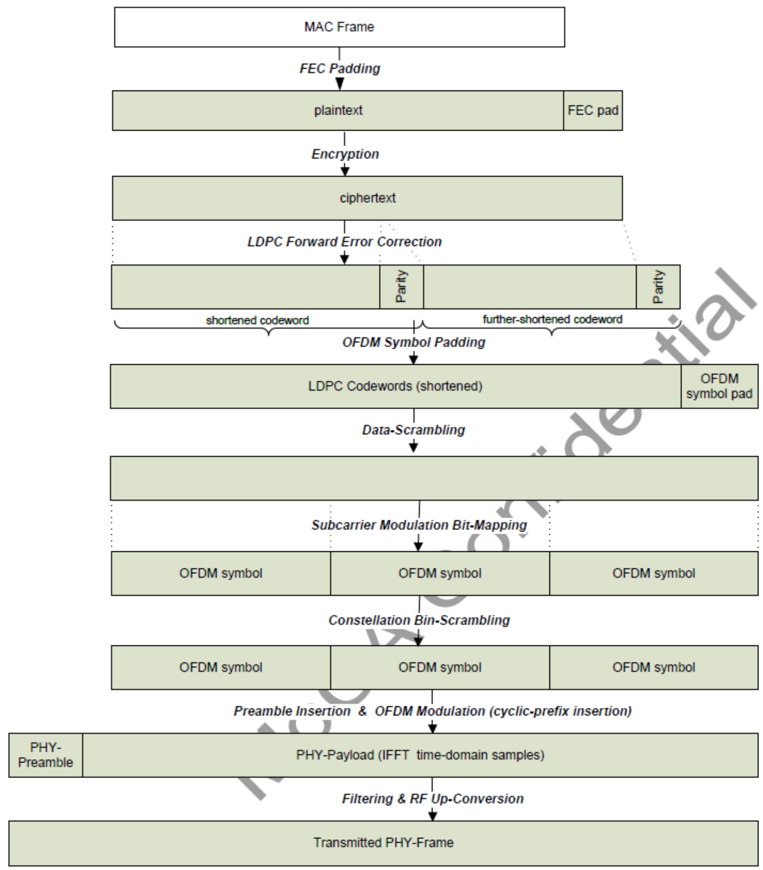
	"The final steps in the transmission chain consist of filtering the signal for spectral compliance, then up-converting the complex signal to the appropriate RF frequency for transmission on the medium." (MoCA 2.0, Section 14.3.10)  **Figure 14-3. Example Formation of Data/Control PHY-Frame from MAC-Frame** (MoCA 2.0, Figure 14-3)